

STN Search 2

10/575,505

***** STN Columbus *****

FILE 'HOME' ENTERED AT 17:41:36 ON 29 SEP 2009

=> file .nash

=> s psychrophilic and heat shock

L8 11 FILE MEDLINE
L9 17 FILE CAPLUS
L10 22 FILE SCISEARCH
L11 10 FILE LIFESCI
L12 17 FILE BIOSIS
L13 9 FILE EMBASE

TOTAL FOR ALL FILES

L14 86 PSYCHROPHILIC AND HEAT SHOCK

=> s l14 not 2004-2009/py

L15 5 FILE MEDLINE
L16 12 FILE CAPLUS
L17 14 FILE SCISEARCH
L18 5 FILE LIFESCI
L19 10 FILE BIOSIS
L20 7 FILE EMBASE

TOTAL FOR ALL FILES

L21 53 L14 NOT 2004-2009/PY

=> dup rem l21

PROCESSING COMPLETED FOR L21

L22 27 DUP REM L21 (26 DUPLICATES REMOVED)

=> d ibib abs 1-27

L22 ANSWER 1 OF 27 SCISEARCH COPYRIGHT (c) 2009 The Thomson Corporation on
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ACCESSION NUMBER: 2003:903472 SCISEARCH Full-text

THE GENUINE ARTICLE: 732TC

TITLE: Gene structure and transcriptional regulation specific to
the groESL operon from the psychrophilic
bacterium Colwellia maris

AUTHOR: Hayashi H (Reprint)

CORPORATE SOURCE: Ehime Univ, Fac Sci, Dept Chem, Matsuyama, Ehime 7908577,
Japan (Reprint)

AUTHOR: Yamauchi S; Okuyama H; Morita E H

CORPORATE SOURCE: Ehime Univ, Grad Sch Sci & Engn, Matsuyama, Ehime 7908577,
Japan; Hokkaido Univ, Grad Sch Environm Earth Sci, Lab
Environm Mol Biol, Sapporo, Hokkaido 0600810, Japan; Ehime
Univ, Satellite Venture Business Lab, Matsuyama, Ehime
7908577, Japan

COUNTRY OF AUTHOR: Japan

SOURCE: ARCHIVES OF MICROBIOLOGY, (OCT 2003) Vol. 180, No. 4, pp.
272-278.

ISSN: 0302-8933.

PUBLISHER: SPRINGER-VERLAG, 175 FIFTH AVE, NEW YORK, NY 10010 USA.

DOCUMENT TYPE: Article; Journal

LANGUAGE: English

REFERENCE COUNT: 36

ENTRY DATE: Entered STN: 31 Oct 2003

Last Updated on STN: 31 Oct 2003

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB The groESL operon of a psychrophilic bacterium, Colwellia maris, was cloned and sequenced. The operon contains two ORFs of 291 bp and 1,650 bp separated by 210 bp. Northern blot analysis suggested that the groESL operon was transcribed as a bicistronic mRNA, and that the amount of mRNA markedly increased after the temperature was raised from 10 degreesC to 20 degreesC. Although the optimum temperatures for GroESL function are different in psychrophilic, mesophilic, and thermophilic bacteria, the deduced amino acid sequences of C. maris GroES and GroEL showed remarkably high similarity with those of GroES and GroEL from mesophilic and thermophilic bacteria. A putative promoter similar to the Escherichia coli sigma(32) consensus sequence was identified. One specific feature of C. maris groESL was that in the putative untranslated region the G+C content was about 24 mol%, which is much lower than that of mesophilic bacteria such as E. coli. The low G+C content may be important for maintaining transcription at low temperatures.

L22 ANSWER 2 OF 27 BIOSIS COPYRIGHT (c) 2009 The Thomson Corporation on STN
 ACCESSION NUMBER: 2003:424698 BIOSIS Full-text
 DOCUMENT NUMBER: PREV200300424698
 TITLE: Adaptive evolution of hsp70 gene expression in the Antarctic ciliate Euplotes focardii.
 AUTHOR(S): La Terza, A. [Reprint Author]; Miceli, C. [Reprint Author]; Luporini, P. [Reprint Author]
 CORPORATE SOURCE: Dipartimento di Biologia Molecolare Cellulare ed Animale, Universita di Camerino, 62032, Camerino, MC, Italy
 SOURCE: Journal of Eukaryotic Microbiology, (March-April 2003) Vol. 50, No. 2, pp. 36A. print.
 Meeting Info.: 23rd Annual Meeting of the Italian Section of the Society of Protozoologists. Sassari, Italy. October 04-05, 2002. Society of Protozoologists.
 ISSN: 1066-5234 (ISSN print).
 DOCUMENT TYPE: Conference; (Meeting)
 Conference; Abstract; (Meeting Abstract)
 LANGUAGE: English
 ENTRY DATE: Entered STN: 17 Sep 2003
 Last Updated on STN: 17 Sep 2003

L22 ANSWER 3 OF 27 MEDLINE on STN DUPLICATE 1
 ACCESSION NUMBER: 2003068654 MEDLINE Full-text
 DOCUMENT NUMBER: PubMed ID: 12579376
 TITLE: GroEL from the psychrophilic bacterium Pseudoalteromonas haloplanktis TAC 125: molecular characterization and gene cloning.
 AUTHOR: Tosco Alessandra; Birolo Leila; Madonna Stefania; Lolli Graziano; Sannia Giovanni; Marino Gennaro
 CORPORATE SOURCE: Dipartimento di Chimica Organica e Biochimica, Universita di Napoli Federico II, Complesso Universitario di Monte Sant'Angelo, Via Cynthia 4, 80126 Naples, Italy.
 SOURCE: Extremophiles : life under extreme conditions, (2003 Feb) Vol. 7, No. 1, pp. 17-28. Electronic Publication: 2002-10-01.
 Journal code: 9706854. ISSN: 1431-0651.
 PUB. COUNTRY: Germany: Germany, Federal Republic of
 DOCUMENT TYPE: (COMPARATIVE STUDY)
 Journal; Article; (JOURNAL ARTICLE)
 (RESEARCH SUPPORT, NON-U.S. GOV'T)
 LANGUAGE: English

FILE SEGMENT: Priority Journals; Space Life Sciences
OTHER SOURCE: GENBANK-AJ243594
ENTRY MONTH: 200306
ENTRY DATE: Entered STN: 12 Feb 2003
Last Updated on STN: 10 Jun 2003
Entered Medline: 9 Jun 2003

AB The heat shock response of the psychrophilic bacterium *Pseudoalteromonas haloplanktis* TAC 125 (PhTAC 125) gives rise to the production of several inducible proteins. Among these, the protein corresponding to a 55-kDa band on SDS-PAGE was purified to homogeneity and identified as a GroEL-like protein. The gene coding for this protein (PhGroEL) was cloned and sequenced; the deduced amino acid sequence shows 82% sequence identity to GroEL from *Escherichia coli* (EcGroEL). The ORF found in the 5' upstream region codes for a homologue of the GroES from *E. coli* (PhGroES, 71% sequence identity to EcGroES). PhGroEL shows a chaperone activity and can use GroES from *E. coli* as a co-chaperone. PhGroEL melting temperature, 6 degrees C lower than that of EcGroEL, and equilibrium unfolding experiments in urea showed a less stable protein architecture for the psychrophilic GroEL. The data herein reported demonstrate that PhGroEL cold adaptation consists in a shift of the protein properties toward lower temperatures without increasing catalytic efficiency at low temperatures. Primary extension analysis depicted a complex organization of regulative elements for the operon containing the genes coding for PhgroES and PhgroEL (PhgroE), suggesting that a fine-tuning of transcription can also be involved in thermal adaptation of PhTAC 125.

L22 ANSWER 4 OF 27 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2002:595022 CAPLUS Full-text

DOCUMENT NUMBER: 137:151139

TITLE: cDNA and protein sequences of highly expressed genes and UV responsive genes in *Synechocystis* and the uses of the genes for identification of corresponding promoters

INVENTOR(S): Huang, Lisa L.; Larossa, Robert A.; McCluskey, Michael P.

PATENT ASSIGNEE(S): E. I. Du Pont de Nemours & Co., USA

SOURCE: PCT Int. Appl., 86 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002061098	A2	20020808	WO 2002-US3926	20020130
WO 2002061098	A3	20031106		

W: CA, US

RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR

US 20020164706	A1	20021107	US 2002-47260	20020115
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PRIORITY APPLN. INFO.: US 2001-264925P P 20010130

AB This invention provided a process for the identification of highly expressed genes in log growth phase and their corresponding promoters and UV responsive genes and their corresponding promoters in cyanobacteria *Synechocystis* sp. PCC6803. The length of UV-B lighs was 290-330 and the intensity of the light was 20-80 μ ES-1m-2. CDNA and protein sequences of 20 genes and encoding protein sequences were disclosed. These genes and promoters can be used to construct expression vectors in cyanobacteria, green algae or plants, for the production of biomaterials from sunlight, a renewable energy resource.

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L22 ANSWER 5 OF 27 BIOSIS COPYRIGHT (c) 2009 The Thomson Corporation on STN
ACCESSION NUMBER: 2001:257433 BIOSIS Full-text
DOCUMENT NUMBER: PREV200100257433
TITLE: Cloning of genes encoding HSPs and analysis of their gene expression in the psychrophilic bacterium, Colwellia maris sp. nov.
AUTHOR(S): Yamauchi, Seiji [Reprint author]; Okuyama, Hidetoshi; Morita, Eugene Hayato [Reprint author]; Hayashi, Hidenori [Reprint author]
CORPORATE SOURCE: Dept. Chem., Fac. Sci., Ehime Univ., Matsuyama, 790-8577, Japan
SOURCE: Plant and Cell Physiology, (2001) Vol. 42, No. Supplement, pp. s122. print.
Meeting Info.: Symposia and Workshops of the 2001 Annual Meeting of the Japanese Society of Plant Physiologists. Fukuoka, Japan. March 23-26, 2001. Japanese Society of Plant Physiologists.
CODEN: PCPHA5. ISSN: 0032-0781.
DOCUMENT TYPE: Conference; (Meeting)
Conference; Abstract; (Meeting Abstract)
Conference; (Meeting Poster)
LANGUAGE: English
ENTRY DATE: Entered STN: 30 May 2001
Last Updated on STN: 19 Feb 2002

L22 ANSWER 6 OF 27 MEDLINE on STN
ACCESSION NUMBER: 2000434394 MEDLINE Full-text
DOCUMENT NUMBER: PubMed ID: 10966867
TITLE: Adaptations of the archaeal cell membrane to heat stress.
AUTHOR: Albers S V; van de Vossenberg J L; Driessen A J; Konings W N
CORPORATE SOURCE: Department of Microbiology, Groningen Biomolecular Sciences and Biotechnology Institute, University of Groningen, Kerklaan 30, 9751 NN Haren, The Netherlands.
SOURCE: Frontiers in bioscience : a journal and virtual library, (2000 Sep 1) Vol. 5, pp. D813-20. Electronic Publication: 2000-09-01. Ref: 55
Journal code: 9709506. E-ISSN: 1093-4715.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
(RESEARCH SUPPORT, NON-U.S. GOV'T)
General Review; (REVIEW)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200009
ENTRY DATE: Entered STN: 28 Sep 2000
Last Updated on STN: 28 Sep 2000
Entered Medline: 19 Sep 2000

AB In extreme environments varying from hot to cold, acidic to alkaline, and highly saline, mainly Archaea are found. Thermophilic and extremely acidophilic Archaea have a membrane that contains membrane spanning tetraether lipids. These tetra-ether membranes have a limited permeability for protons even at the high temperatures of growth and this property makes it possible for thermophilic archaea to maintain a viable proton motive force under the extreme conditions. -Ether lipids cannot be degraded easily and are highly stable which is also a requirement for life under extreme conditions. Psychrophilic and mesophilic Bacteria, and all Archaea adjust the lipid

composition of their membranes so that the proton permeability of their membranes remains within a narrow range. This phenomenon is termed 'homeoprotein permeability adaptation'. Thermophilic Bacteria are the only prokaryotes that are unable to control the proton permeability of their membranes. These organisms have to rely on the less permeable sodium ions in energy transducing processes in their membrane.

L22 ANSWER 7 OF 27 MEDLINE on STN

ACCESSION NUMBER: 1999413229 MEDLINE Full-text

DOCUMENT NUMBER: PubMed ID: 10483731

TITLE: Cloning of two cold shock genes, cspA and cspG, from the deep-sea psychrophilic bacterium *Shewanella violacea* strain DSS12.

AUTHOR: Fujii S; Nakasone K; Horikoshi K

CORPORATE SOURCE: DEEPSTAR Group, Japan Marine Science and Technology Center, Yokosuka, Japan.. fujii@jamstec.go.jp

SOURCE: FEMS microbiology letters, (1999 Sep 1) Vol. 178, No. 1, pp. 123-8.

Journal code: 7705721. ISSN: 0378-1097.

PUB. COUNTRY: Netherlands

DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)

LANGUAGE: English

FILE SEGMENT: Priority Journals

OTHER SOURCE: GENBANK-AB015429; GENBANK-AB022716

ENTRY MONTH: 199910

ENTRY DATE: Entered STN: 26 Oct 1999

Last Updated on STN: 26 Oct 1999

Entered Medline: 14 Oct 1999

AB We cloned and characterized two cold shock inducible genes from the deep-sea psychrophilic bacterium *Shewanella violacea* strain DSS12. The cloned genes, designated cspA and cspG, encode proteins each consisting of 70 amino acid residues which show 62 and 67% sequence identity with *Escherichia coli* CspA and CspG, respectively. AT-rich UP elements were found immediately upstream of the promoter region and the cspA and cspG mRNA contained unusually long 5' untranslated regions like that in the *E. coli* cspA, cspB, cspG and cspI genes. Following a temperature downshift to 4 degrees C or -1 degree C, the levels of cspA and cspG mRNA increased and the level of expression of cspG was greater than that of cspA both before and after cold shock. These results suggest that CspA and CspG may function as RNA chaperones, the mRNAs encoded by these two genes may be regulated post-transcriptionally and they may function as regulators of other cold shock inducible genes like in *E. coli*.

L22 ANSWER 8 OF 27 SCISEARCH COPYRIGHT (c) 2009 The Thomson Corporation on STN

ACCESSION NUMBER: 1998:321237 SCISEARCH Full-text

THE GENUINE ARTICLE: ZJ703

TITLE: Cold stress responses in mesophilic bacteria

AUTHOR: Panoff J M (Reprint)

CORPORATE SOURCE: Univ Caen, IRBA, Lab Microbiol Alimentaire, F-14032 Caen, France (Reprint)

AUTHOR: Thammavongs B; Gueguen M; Boutibonnes P

COUNTRY OF AUTHOR: France

SOURCE: CRYOBIOLOGY, (MAR 1998) Vol. 36, No. 2, pp. 75-83. ISSN: 0011-2240.

PUBLISHER: ACADEMIC PRESS INC, 525 B ST, STE 1900, SAN DIEGO, CA 92101-4495 USA.

DOCUMENT TYPE: General Review; Journal

LANGUAGE: English

REFERENCE COUNT: 89
ENTRY DATE: Entered STN: 1998
Last Updated on STN: 1998

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB The diversity of the prokaryotes that have been studied, combined with the many different effects of low temperature, has led to an extensive literature concerning cold stress responses in mesophilic bacteria. The aim of this review is to discuss the effects of cold on the behavior of bacteria. The following three responses will be described: (i) biochemical modifications consisting first of membrane fatty acid desaturation and second of the synthesis of cold stress proteins. (ii) physiological responses of the cells to permit growth at low temperatures above 0 degrees C and cryotolerance at lower temperatures, and (iii) control of the cold shock response at a transcriptional and/or translational level. This paper reviews knowledge, most of which has been acquired in the last 10 years, in the field of cold stress responses. It is hoped that these data will help to focus attention on the metabolic responses associated with environmental disturbance. (C) 1998 Academic Press.

L22 ANSWER 9 OF 27 MEDLINE on STN DUPLICATE 2
ACCESSION NUMBER: 1998340931 MEDLINE Full-text
DOCUMENT NUMBER: PubMed ID: 9676242
TITLE: Heat shock response in
psychrophilic and psychrotrophic yeast from
Antarctica.
AUTHOR: Deegenars M L; Watson K
CORPORATE SOURCE: Department of Molecular and Cellular Biology, University of
New England, Armidale, Australia.
SOURCE: Extremophiles : life under extreme conditions, (1998 Jan)
Vol. 2, No. 1, pp. 41-9.
Journal code: 9706854. ISSN: 1431-0651.
PUB. COUNTRY: GERMANY: Germany, Federal Republic of
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
(RESEARCH SUPPORT, NON-U.S. GOV'T)
LANGUAGE: English
FILE SEGMENT: Priority Journals; Space Life Sciences
ENTRY MONTH: 199808
ENTRY DATE: Entered STN: 20 Aug 1998
Last Updated on STN: 29 Jan 1999
Entered Medline: 7 Aug 1998

AB The response to heat stress in six yeast species isolated from Antarctica was examined. The yeast were classified into two groups: one psychrophilic, with a maximum growth temperature of 20 degrees C, and the other psychrotrophic, capable of growth at temperatures above 20 degrees C. In addition to species-specific heat shock protein (hsp) profiles, a heat shock (15 degrees C-25 degrees C for 3 h) induced the synthesis of a 110-kDa protein common to the psychrophiles, *Mrakia stokesii*, *M. frigida*, and *M. gelida*, but not evident in *Leucosporidium antarcticum*. Immunoblot analyses revealed heat shock inducible proteins (hsps) corresponding to hsps 70 and 90. Interestingly, no proteins corresponding to hsps 60 and 104 were observed in any of the psychrophilic species examined. In the psychrotrophic yeast, *Leucosporidium fellii* and *L. scottii*, in addition to the presence of hsps 70 and 90, a protein corresponding to hsp 104 was observed. In psychrotrophic yeast, as observed in psychrophilic yeast, the absence of a protein corresponding to hsp 60 was noted. Relatively high endogenous levels of trehalose which were elevated upon a heat shock were exhibited by all species. A 10 Celsius degree increase in temperature above the growth temperature (15 degrees C) of psychrophiles and psychrotrophs was optimal for heat shock induced thermotolerance. On the

other hand, in psychrotrophic yeast grown at 25 degrees C, only a 5 Celsius degree increase in temperature was necessary for heat shock induced thermotolerance. Induced thermotolerance in all yeast species was coincident with hsp synthesis and trehalose accumulation. It was concluded that psychrophilic and psychrotrophic yeast, although exhibiting a stress response similar to mesophilic *Saccharomyces cerevisiae*, nevertheless had distinctive stress protein profiles.

L22 ANSWER 10 OF 27 SCISEARCH COPYRIGHT (c) 2009 The Thomson Corporation on STN

ACCESSION NUMBER: 1998:61960 SCISEARCH Full-text
THE GENUINE ARTICLE: YQ746
TITLE: Cold temperature adaptation and growth of microorganisms
AUTHOR: Foegeding P M (Reprint)
CORPORATE SOURCE: N Carolina State Univ, Dept Food Sci, Box 7624, Raleigh, NC 27695 USA (Reprint)
AUTHOR: Berry E D
CORPORATE SOURCE: N Carolina State Univ, Dept Food Sci, Raleigh, NC 27695 USA
COUNTRY OF AUTHOR: USA
SOURCE: JOURNAL OF FOOD PROTECTION, (DEC 1997) Vol. 60, No. 12, pp. 1583-1594.
ISSN: 0362-028X.
PUBLISHER: INT ASSOC FOOD PROTECTION, 6200 AURORA AVE SUITE 200W, DES MOINES, IA 50322-2863 USA.
DOCUMENT TYPE: General Review; Journal
LANGUAGE: English
REFERENCE COUNT: 137
ENTRY DATE: Entered STN: 1998
Last Updated on STN: 1998

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Most microorganisms must accommodate a variety of changing conditions and stresses in their environment in order to survive and multiply. Because of the impact of temperature on all reactions of the cell, adaptations to fluctuations in temperature are possibly the most common. Widespread in the environment and well-equipped for cold temperature growth, psychrophilic and psychrotrophic microorganisms may yet make numerous adjustments when faced with temperatures lower than optimum. Phospholipid and fatty acid alterations resulting in increased membrane fluidity at lower temperatures have been described for many cold tolerant microorganisms while others may make no similar adjustment. While the enzymes of cold growing bacteria have been less extensively studied than those of thermophilic bacteria, it appears that function at low temperature requires enzymes with flexible conformational structure, in order to compensate for lower reaction rates. In many organisms, including psychrophilic and psychrotrophic bacteria, specific sets of cold shock proteins are induced upon abrupt shifts to colder temperatures. While this cold shock response has not been fully delineated, it appears to be adaptive, and may function to promote the expression of genes involved in translation when cells are displaced to lower temperatures. The cold shock response of *Escherichia coli* has been extensively studied, and the major cold shock protein CspA appears to be involved in the regulation of the response. Upon cold shock, the induction of CspA and its counterparts in most microorganisms studied is prominent, but transient; studies of this response in some psychrotrophic bacteria have reported constitutive synthesis and continued synthesis during cold temperature growth of CspA homologues, and it will be interesting to learn if these are common mechanisms of among cold tolerant organisms. Psychrotrophic microorganisms continue

to be a spoilage and safety problem in refrigerated foods, and a greater understanding of the physiological mechanisms and implications of cold temperature adaptation and growth should enhance our ability to design more effective methods of preservation.

L22 ANSWER 11 OF 27 MEDLINE on STN DUPLICATE 3
ACCESSION NUMBER: 1997372533 MEDLINE Full-text
DOCUMENT NUMBER: PubMed ID: 9228753
TITLE: Stress proteins and stress tolerance in an Antarctic, psychrophilic yeast, *Candida psychrophila*.
AUTHOR: Deegenars M L; Watson K
CORPORATE SOURCE: Department of Molecular and Cellular Biology, University of New England, Armidale, NSW, Australia..
mdeegen2@metz.une.edu.au
SOURCE: FEMS microbiology letters, (1997 Jun 15) Vol. 151, No. 2, pp. 191-6.
Journal code: 7705721. ISSN: 0378-1097.
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
(RESEARCH SUPPORT, NON-U.S. GOV'T)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199708
ENTRY DATE: Entered STN: 13 Aug 1997
Last Updated on STN: 13 Aug 1997
Entered Medline: 7 Aug 1997
AB Conditions are described for the heat shock acquisition of thermotolerance, peroxide tolerance and synthesis of heat shock proteins (hsps) in the Antarctic, psychrophilic yeast *Candida psychrophila*. Cells grown at 15 degrees C and heat shocked at 25 degrees C (3 h) acquired tolerance to heat (35 degrees C) and hydrogen peroxide (100 mM). Novel heat shock inducible proteins at 80 and 110 kDa were observed as well as the presence of hsp 90, 70 and 60. The latter hsps were not significantly heat shock inducible. The absence of hsp 104 was intriguing and it was speculated that the 110 kDa protein may play a role in stress tolerance in psychrophilic yeasts, similar to that of hsp 104 in mesophilic species.

L22 ANSWER 12 OF 27 SCISEARCH COPYRIGHT (c) 2009 The Thomson Corporation on STN
ACCESSION NUMBER: 1996:427012 SCISEARCH Full-text
THE GENUINE ARTICLE: UP180
TITLE: Effect of different temperature upshifts on protein synthesis by the psychrotrophic bacterium *Pseudomonas fragi*
AUTHOR: Michel V (Reprint); Labadie J; Hebraud M
CORPORATE SOURCE: INRA, UNITE RECH MICROBIOL, RECH VIANDE STN, F-63122 ST GENES CHAMPANE, FRANCE
COUNTRY OF AUTHOR: FRANCE
SOURCE: CURRENT MICROBIOLOGY, (JUL 1996) Vol. 33, No. 1, pp. 16-25
ISSN: 0343-8651.
PUBLISHER: SPRINGER VERLAG, 175 FIFTH AVE, NEW YORK, NY 10010.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE
LANGUAGE: English
REFERENCE COUNT: 38
ENTRY DATE: Entered STN: 1996
Last Updated on STN: 1996

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Pseudomonas fragi, a psychrotroph bacterium involved in meat product spoilage, was shifted either from 5 degrees to 20 degrees C or 30 degrees C and from 28 degrees to 34 degrees C. The heat-shocked cells in the mid-log phase rapidly reached the characteristic growth rate of the postshock temperature. The patterns of synthesized proteins were compared by autoradiography of two-dimensional gel electrophore-grams; The rates of synthesis, after transfer of cells from 5 degrees to 30 degrees C, 5 degrees to 20 degrees C, and 28 degrees to 34 degrees C: changed for 30, 26, and 31 proteins respectively, of which 19, 17, and 12 were increased respectively. Thirteen proteins changed similarly for the three treatments, and two of the seven overexpressed proteins were immunologically related to the Escherichia coli DnaK and GroEL heat shock proteins. From the four low-molecular-mass proteins, belonging to the family of DNA-binding cold shock proteins (CSPs) such as CS7.4, the major E. coli CSP [15], the amounts of C7.0 and C8.0 decreased rapidly after the upshifts, whereas that of E7.0 and E8.0 increased greatly.

L22 ANSWER 13 OF 27 EMBASE COPYRIGHT (c) 2009 Elsevier B.V. All rights reserved on STN

ACCESSION NUMBER: 1996281464 EMBASE Full-text
TITLE: Overview of hyperthermophiles and their heat-shock proteins.
AUTHOR: Baross, J.A. (correspondence); Holden, J.F.
CORPORATE SOURCE: School of Oceanography, University of Washington, Seattle, WA 98195, United States.
SOURCE: Advances in Protein Chemistry, (1996) Vol. 48, pp. 1-27.
ISSN: 0065-3233 CODEN: APCHA2
COUNTRY: United States
DOCUMENT TYPE: Journal; General Review; (Review)
FILE SEGMENT: 029 Clinical and Experimental Biochemistry
004 Microbiology: Bacteriology, Mycology, Parasitology and Virology
LANGUAGE: English
SUMMARY LANGUAGE: English
ENTRY DATE: Entered STN: 7 Oct 1996
Last Updated on STN: 7 Oct 1996

AB There is mounting evidence that only a small fraction of the species of hyperthermophilic archaea and bacteria that grow in thermal environments have been isolated. It is also clear that this same high diversity exists for all prokaryotes, especially for all thermal groups of archaea. Since the rooted phylogenetic trees point to hyperthermophiles as the ancestor, the possibility exists that some hot habitats, with characteristics similar to the earliest archaean environments based on current models, may yield unique hyperthermophilic species. In particular, species that have very slowly evolving genotypes could add to our understanding of the evolutionary relationships between all extant organisms and their metabolic pathways, while providing gene sequences which would allow for a better scrutiny of the validity and evolutionary implications of the Woesean rooted phylogenetic tree. Likewise, a comparison of the specific gene sequences and physiologic characteristics of heterotrophic psychrophilic and hyperthermophilic archaea would be a powerful test of the hypothesis that all extant organisms evolved from hyperthermophiles. A comparison of the amino acid sequence and structural properties of functionally identical psychrophilic and hyperthermophilic archaeal proteins would also provide information on their evolution, while adding substantially to our understanding of the key amino acid sequences and structural characteristics that allow some proteins to remain stable at temperatures greater than 140°C and others to show catalytic activity at temperatures below 0°C. At present very little is known about

stress responses and stress proteins in hyperthermophiles. The species tested show a heat-shock response, but there is not enough information to draw conclusions about the heat-shock proteins or their function except for the 55-kDa chaperone identified in two species of hyperthermophilic Crenarchaeota. The putative 98-kDa heat-shock protein from *Pyrococcus* strain ES4 (Euryarchaeota) indicate that there may be a high diversity of heat-shock proteins in hyperthermophilic archaea. The phylogenetic implications from nucleotide sequences of hsp70 from mesophilic archaea show a close relationship to gram-positive bacteria. Further analyses of nucleotide sequences of heatshock proteins in hyperthermophilic archaea and bacteria are needed to assess their significance in the evolution of stress responses and whether these protein sequences would be useful in phylogenetic studies.

L22 ANSWER 14 OF 27 LIFESCI COPYRIGHT 2009 CSA on STN

ACCESSION NUMBER: 96:9154 LIFESCI Full-text

TITLE: Submerged batch culture of the psychrophile *Monographella nivalis* in a defined medium; growth, carbohydrate utilization and responses to temperature

AUTHOR: Cairns, A.J.; Howarth, C.J.; Pollock, C.J.

CORPORATE SOURCE: Cell Biol. Dep., Inst. Grassland and Environ. Res., Plas Gogerddan, Aberystwyth, SY23 3EB, UK

SOURCE: NEW PHYTOL., (1995) vol. 129, no. 2, pp. 299-308.
ISSN: 0028-646X.

DOCUMENT TYPE: Journal

FILE SEGMENT: K; A

LANGUAGE: English

SUMMARY LANGUAGE: English

AB An asporogenous strain of the pink snow mould fungus, *Monographella nivalis* (Schaffnit) E. Mueller, anamorph *Gerlachia nivalis* (Ces. ex Sac.) W. Gams & E. Mueller (Syn. *Fusarium nivale* Ces. ex Sacc.), grew at 5 degree C on a defined salts medium plus vitamins and utilized a variety of simple and polymeric carbohydrates as the sole carbon and energy source. Mycelium was grown at temperatures between 3 and 15 degree C in aerated submerged fermentation culture in chemically defined medium plus sucrose. Optimum growth rates of 0.035-0.033 h⁻¹ occurred between 9 and 12 degree C. Growth in a simple medium showed that all biochemical and physiological processes necessary for growth were functional at 3 degree C. The growth performance of the organism at low temperatures was no better than would be expected from extrapolation of mesophilic growth responses to temperature. The optimum growth temperature of 9-12 degree C showed that some biochemical or physiological process was impaired above 12 degree C. Uptake and incorporation of ³⁵S-methionine by mycelium at different temperatures showed that general protein synthesis increased up to 25 degree C, and hence was not responsible per se for the sensitivity to temperatures above 12 degree C. Heat shock proteins were synthesized at the relatively low temperature of 25 degree C, consistent with the low temperature optimum for growth. When grown with sucrose as the sole carbon source, the mycelium catalyzed the extracellular hydrolysis of sucrose, releasing glucose and fructose together with a small amount of fructan trisaccharides and a trace of tetra- and penta-saccharides. Fructan accumulation was transient, corresponding with maximal rates of sucrose hydrolysis. Most biomass formation occurred in the absence of fructan in the culture, hence fructan was not necessary for growth at low temperature and did not appear to function as a cryoprotectant. Invertase activity was mostly (60-70%) bound to mycelium; the remainder was free in the culture supernatant. The regulation of invertase expression appeared to be by sucrose-induction, rather than by end-product repression. Rates of sucrose hydrolysis in culture were temperature-sensitive and were markedly depressed above 12 degree C, indicating inhibition of invertase formation.

L22 ANSWER 15 OF 27 BIOSIS COPYRIGHT (c) 2009 The Thomson Corporation on
STN

ACCESSION NUMBER: 1994:209587 BIOSIS Full-text
DOCUMENT NUMBER: PREV199497222587
TITLE: Properties of cold-adapted microorganisms and their
potential role in biotechnology.
AUTHOR(S): Margesin, R. [Reprint author]; Schinner, F.
CORPORATE SOURCE: Inst. Microbiol., Univ. Innsbruck, Technikerstrasse 25,
A-6020 Innsbruck, Austria
SOURCE: Journal of Biotechnology, (1994) Vol. 33, No. 1, pp. 2-14.
CODEN: JBITD4. ISSN: 0168-1656.
DOCUMENT TYPE: Article
General Review; (Literature Review)
LANGUAGE: English
ENTRY DATE: Entered STN: 10 May 1994
Last Updated on STN: 10 May 1994

AB Cold-adapted (psychrophilic and psychrotrophic) microorganisms are distinguished from mesophiles by their ability to grow at low temperatures. They are widely distributed in nature. Their response to high temperatures was shown to be disruption in protein synthesis by inability of RNA formation, alterations of the structure of nucleic acids, inactivation of thermolabile enzymes, activation of lytic enzymes, alterations of the cell morphology, inhibition of cell division and induction of heat shock proteins. At low temperatures, among other physiological characteristics, psychrophiles and psychrotrophs have slower metabolic rates and higher catalytic efficiencies than mesophiles. The genetic basis of cold adaptation is not cleared up. Cold-adapted microorganisms have a considerable potential in biotechnological application (waste treatment at ambient temperatures, enzymology, food industry, medicine).

L22 ANSWER 16 OF 27 CAPLUS COPYRIGHT 2009 ACS on STN DUPLICATE 4

ACCESSION NUMBER: 1994:265380 CAPLUS Full-text
DOCUMENT NUMBER: 120:265380
ORIGINAL REFERENCE NO.: 120:46845a,46848a
TITLE: Properties of cold-adapted microorganisms and their
potential role in biotechnology
AUTHOR(S): Margesin, R.; Schinner, F.
CORPORATE SOURCE: Inst. Microbiol., Univ. Innsbruck, Innsbruck, A-6020,
Austria
SOURCE: Journal of Biotechnology (1994), 33(1), 1-14
CODEN: JBITD4; ISSN: 0168-1656
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English

AB A review with 88 refs. Cold-adapted (psychrophilic and psychrotrophic) microorganisms are distinguished from mesophiles by their ability to grow at low temps. They are widely distributed in nature. Their response to high temps. was shown to be disrupted in protein synthesis by inability of RNA formation, alternations of the structure of nucleic acids, inactivation of thermolabile enzymes, activation of lytic enzymes, alterations of the cell morphol., inhibition of cell division and induction of heat shock proteins. At low temps., among other physiol. characteristics, psychrophiles and psychrotrophs have slower metabolic rates and higher catalytic efficiencies than mesophiles. The genetic basis of cold adaptation is not cleared up. Cold-adapted microorganisms have a considerable potential in biotechnol. application (waste treatment at ambient temps., enzymol., food industry, medicine). OS.CITING REF COUNT: 93 THERE ARE 93 CAPLUS RECORDS THAT CITE THIS

RECORD (93 CITINGS)

L22 ANSWER 17 OF 27 SCISEARCH COPYRIGHT (c) 2009 The Thomson Corporation on
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ACCESSION NUMBER: 1992:635282 SCISEARCH Full-text
THE GENUINE ARTICLE: JV020
TITLE: AN ANALYSIS OF THE EFFECT OF CHANGES IN GROWTH TEMPERATURE
ON PROTEOLYSIS INVIVO IN THE PSYCHROPHILIC
BACTERIUM VIBRIO SP STRAIN ANT-300
AUTHOR: ARAKI T (Reprint)
CORPORATE SOURCE: HOKKAIDO UNIV, INST LOW TEMP SCI, SAPPORO, HOKKAIDO 060,
JAPAN (Reprint)
COUNTRY OF AUTHOR: JAPAN
SOURCE: JOURNAL OF GENERAL MICROBIOLOGY, (OCT 1992) Vol. 138, Part
10, pp. 2075-2082.
ISSN: 0022-1287.
PUBLISHER: SOC GENERAL MICROBIOLOGY, HARVEST HOUSE 62 LONDON ROAD,
READING, BERKS, ENGLAND RG1 5AS.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE
LANGUAGE: English
REFERENCE COUNT: 31
ENTRY DATE: Entered STN: 1994
Last Updated on STN: 1994

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB In the psychrophilic bacterium *Vibrio* sp. strain ANT-300, the rate of
protein degradation in vivo, measured at fixed temperatures, increased
with elevation of the growth temperature. A shift in growth temperature
induced a marked increase in this rate. Dialysed cell-free extracts
hydrolysed exogenous insulin, globin and casein (in decreasing order of
activity) but did not hydrolyse exogenous cytochrome c. Cells contained
at least seven proteases separated by DEAE-Sephacel chromatography, one
of which was an ATP-dependent serine protease. The ATP-dependent
proteolytic activity in extracts of cells incubated for 3 h at 16-
degrees-C after a shift-up from 0-degrees-C increased to a level 36 %
and 17 % higher than that of cells grown at 0-degrees-C and 13-degrees-
C, respectively. A shift-down to 0-degrees-C from 13-degrees-C induced
only a slight increase in the proteolytic activity. Extracts of all
cells, whether exposed to temperature shifts or not, showed the same
temperature dependence with respect to both ATP-dependent and ATP-
independent protease activity. In all the extracts these proteases also
exhibited the same heat lability. The ATP-dependent protease was
inactivated by incubation at temperatures above 25-degrees-C. There was
an increase in ATP-independent protease activity during incubation at
temperatures between 25 and 30-degrees-C, but a decrease at 35-degrees-C
and higher. These results suggest that the marked increases in
proteolysis in vivo, caused by a shift in temperature, may result not
only from increases in levels of ATP-dependent serine protease(s) but
also from increases in the susceptibility of proteins to degradation.

L22 ANSWER 18 OF 27 SCISEARCH COPYRIGHT (c) 2009 The Thomson Corporation on
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ACCESSION NUMBER: 1993:60940 SCISEARCH Full-text
THE GENUINE ARTICLE: KJ165
TITLE: COLD SHOCK PROTEINS AND COLD-ACCLIMATION PROTEINS IN A
PSYCHROTROPHIC BACTERIUM
AUTHOR: WHYTE L G (Reprint); INNISS W E
CORPORATE SOURCE: UNIV WATERLOO, DEPT BIOL, WATERLOO N2L 3G1, ONTARIO,
CANADA
COUNTRY OF AUTHOR: CANADA
SOURCE: CANADIAN JOURNAL OF MICROBIOLOGY, (DEC 1992) Vol. 38, No.

12, pp. 1281-1285.
ISSN: 0008-4166.
PUBLISHER: NATL RESEARCH COUNCIL CANADA, RESEARCH JOURNALS, MONTREAL
RD, OTTAWA ON K1A 0R6, CANADA.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: English
REFERENCE COUNT: 29
ENTRY DATE: Entered STN: 1994
Last Updated on STN: 1994

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB The synthesis of proteins in the psychrotrophic bacterium *psychrophilus* in response to both cold shock and continuous growth at low temperatures was examined Cold shocks of 20 to 0, 5, or 10-degrees-C resulted in the induction of nine, seven, and five cold shock proteins, respectively, as determined by 2-dimensional gel electrophoresis and computing scanning laser densitometry. Two cold shock proteins, with molecular masses of 61 and 34 kDa, which were induced in *B. psychrophilus* by cold shocks of 20 to 0 or 5-degrees-C, were not induced in a cold-sensitive mutant of *B. psychrophilus*. Analysis of protein profiles of *B. psychrophilus* during continuous growth at 0, 5, or 10-degrees-C revealed the synthesis of 11, 10, and 4 cold acclimation proteins, respectively. Some of these cold acclimation proteins were similar to cold shock proteins. In addition, the relative synthesis of both cold shock proteins and cold acclimation proteins increased with decreasing temperature. Thus, both types of proteins increased both in number and relative synthesis in response to cold shock and continuous growth at low temperature.

L22 ANSWER 19 OF 27 CAPLUS COPYRIGHT 2009 ACS on STN DUPLICATE 5

ACCESSION NUMBER: 1992:37717 CAPLUS Full-text
DOCUMENT NUMBER: 116:37717
ORIGINAL REFERENCE NO.: 116:6369a,6372a
TITLE: Changes in rates of synthesis of individual proteins
in a psychrophilic bacterium after a shift
in temperature
AUTHOR(S): Araki, Tadashi
CORPORATE SOURCE: Inst. Low Temp. Sci., Hokkaido Univ., Sapporo, 060,
Japan
SOURCE: Canadian Journal of Microbiology (1991), 37(11), 840-7
CODEN: CJMIAZ; ISSN: 0008-4166
DOCUMENT TYPE: Journal
LANGUAGE: English

AB In the psychrophilic bacterium *Vibrio* sp. strain ANT-300, which has the ability to grow efficiently between 13 and -2°, with an optimum at 7°, cells in steady-state growth at 0 and 13° appeared to exhibit different patterns in the levels of certain individual proteins. With a shift in temperature, the steady-state level of individual proteins was achieved only after dramatic transient changes in the rates of synthesis of a small number of those proteins whose levels would be adjusted. Upon a shift up from 0 to 13°, the rates of synthesis of at least 25 proteins increased transiently, while increased rates of synthesis of 39 proteins were induced immediately upon a shift down from 13 to 0°. The proteins of which the levels would be adjusted were synthesized at differential rates, which varied conspicuously with respect to timing after the shifts in temperature Such changes appear to be active regulatory responses to changes in temperature
OS.CITING REF COUNT: 13 THERE ARE 13 CAPLUS RECORDS THAT CITE THIS
RECORD (13 CITINGS)

L22 ANSWER 20 OF 27 SCISEARCH COPYRIGHT (c) 2009 The Thomson Corporation on
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ACCESSION NUMBER: 1991:245817 SCISEARCH Full-text
THE GENUINE ARTICLE: FH511
TITLE: THE EFFECT OF TEMPERATURE SHIFTS ON PROTEIN-SYNTHESIS BY
THE PSYCHROPHILIC BACTERIUM VIBRIO SP
STRAIN-ANT-300
AUTHOR: ARAKI T (Reprint)
CORPORATE SOURCE: HOKKAIDO UNIV, INST LOW TEMP SCI, SAPPORO, HOKKAIDO 060,
JAPAN (Reprint)
COUNTRY OF AUTHOR: JAPAN
SOURCE: JOURNAL OF GENERAL MICROBIOLOGY, (APR 1991) Vol. 137, Part
4, pp. 817-826.
ISSN: 0022-1287.
PUBLISHER: SOC GENERAL MICROBIOLOGY, HARVEST HOUSE 62 LONDON ROAD,
READING, BERKS, ENGLAND RG1 5AS.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE
LANGUAGE: English
REFERENCE COUNT: 37
ENTRY DATE: Entered STN: 1994
Last Updated on STN: 1994

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB In the psychrophilic bacterium *Vibrio* sp. strain ANT-300, the temperature-related characteristics of protein synthesis in cells grown at 0-degrees-C differed from those of cells grown at 13-degrees-C. Cells grown at 0-degrees-C and 13-degrees-C transported amino acids at the same rates, dependent on the temperature at which rates were measured. The rates of protein synthesis in extracts of cells grown at 0-degrees-C and at 13-degrees-C differed, as a result of the changes in the properties of the soluble fraction involved in protein synthesis. Concurrently, levels of more than 24 polypeptides in the soluble fraction changed considerably. These results suggest that the difference in temperature dependence of protein synthesis in cells grown at various temperatures may be brought about by specific changes in the levels of a small number of polypeptides (less than 15% of the total number of proteins detected by silver-staining) in response to a change in temperature.

L22 ANSWER 21 OF 27 CAPLUS COPYRIGHT 2009 ACS on STN DUPLICATE 6

ACCESSION NUMBER: 1990:437530 CAPLUS Full-text
DOCUMENT NUMBER: 113:37530
ORIGINAL REFERENCE NO.: 113:6329a,6332a
TITLE: Thermotolerance, cell filamentation, and induced
protein synthesis in psychrophilic and
psychrotrophic bacteria
AUTHOR(S): McCallum, Kirk L.; Inniss, William E.
CORPORATE SOURCE: Dep. Biol., Univ. Waterloo, Waterloo, ON, N2L 3G1,
Can.
SOURCE: Archives of Microbiology (1990), 153(6), 585-90
CODEN: AMICCW; ISSN: 0302-8933
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Both the psychrophile *Aquaspirillum arcticum* and the psychrotroph *Bacillus psychrophilus* acquired thermotolerance when either heat shocked or treated with nalidixic acid, 2 conditions which also resulted in the induction of heat-shock proteins and/or stress proteins and also cell filamentation. The possible relatedness of acquisition of thermotolerance and cell filamentation was examined by inhibiting cell filamentation with 1.5 KCl. *A. arcticum* cells which were heat shocked in the presence of KCl did not become filamentous nor acquire thermotolerance, suggesting that these 2 responses may be related. On the other

hand, when cells of *B. psychrophilus* were treated in a similar fashion, they also were prevented from cell filamentation, but their ability to become thermotolerant was unaffected. When *A. arcticum* cells were heat shocked in the presence of chloramphenicol, heat-shock protein synthesis was inhibited but not the acquisition of thermotolerance. Similar expts. with *B. psychrophilus* revealed that partial induction of heat-shock proteins still occurred; however, no thermotolerance was exhibited. OS.CITING REF COUNT: 9 THERE ARE 9 CAPLUS RECORDS THAT CITE THIS RECORD

(9 CITINGS)

L22 ANSWER 22 OF 27 EMBASE COPYRIGHT (c) 2009 Elsevier B.V. All rights reserved on STN

ACCESSION NUMBER: 1990062813 EMBASE Full-text
TITLE: Characterization of *Aquaspirillum arcticum* sp. nov., a new psychrophilic bacterium.
AUTHOR: Butler, B.J.; McCallum, K.L.; Inniss, W.E.
CORPORATE SOURCE: Department of Biology, University of Waterloo, Waterloo, Ont. N2L 3G1, Canada.
SOURCE: Systematic and Applied Microbiology, (1989) Vol. 12, No. 3, pp. 263-266.
ISSN: 0723-2020 CODEN: SAMIDF
COUNTRY: Germany
DOCUMENT TYPE: Journal; Article
FILE SEGMENT: 004 Microbiology: Bacteriology, Mycology, Parasitology and Virology
LANGUAGE: English
SUMMARY LANGUAGE: English
ENTRY DATE: Entered STN: 13 Dec 1991
Last Updated on STN: 13 Dec 1991

AB A new psychrotrophic bacterium was isolated from an arctic sediment. Assigned to the genus *Aquaspirillum* on the basis of its morphological and physiological characteristics, it differed from previously described species of *Aquaspirillum* and was designated *Aquaspirillum arcticum* sp. nov.

L22 ANSWER 23 OF 27 CAPLUS COPYRIGHT 2009 ACS on STN DUPLICATE 7

ACCESSION NUMBER: 1989:493620 CAPLUS Full-text
DOCUMENT NUMBER: 111:93620
ORIGINAL REFERENCE NO.: 111:15677a,15680a
TITLE: Stress or heat shock protein synthesis and cellular filamentation in psychrophilic and psychrotrophic bacteria
AUTHOR(S): McCallum, Kirk L.; Butler, Barbara J.; Inniss, William E.
CORPORATE SOURCE: Dep. Biol., Univ. Waterloo, Waterloo, ON, N2L 3G1, Can.
SOURCE: Archives of Microbiology (1989), 152(2), 148-53
CODEN: AMICCW; ISSN: 0302-8933
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The response of an arctic psychrophile *Aquaspirillum* sp. Res-10 and the psychrotroph *Bacillus psychrophilus* to heat shock and nalidixic acid was investigated. Both agents induced heat shock proteins (hsps) or stress proteins and cellular filamentation in these bacteria. With *Aquaspirillum* sp. Res-10, nalidixic acid added to cells at 0° induced the synthesis of 9 stress proteins, 3 of which were similar to hsps induced during a 0 to 20° heat shock. Treatment of *B. psychrophilus* with nalidixic acid at 20° resulted in induction of 12 stress proteins, 4 of which were similar to hsps produced during heat shock from 20 to 32°. Using the *dnaK* gene of *Escherichia coli* (the equivalent of the major hsp70 gene found in many organisms) as a radiolabeled probe, it was found that both the

psychrophile and the psychrotroph possessed genomic sequences which were homologous to this gene. In addition, this same radiolabeled probe was used to detect the induction of homologous mRNA transcripts in *Aquaspirillum* sp. Res-10. OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L22 ANSWER 24 OF 27 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 1989:453978 CAPLUS Full-text
DOCUMENT NUMBER: 111:53978
ORIGINAL REFERENCE NO.: 111:9113a,9116a
TITLE: Heat shock/stress protein
synthesis and thermotolerance in psychrophilic
/psychrotrophic bacteria
AUTHOR(S): McCallum, Kirk Leslie
CORPORATE SOURCE: Univ. Waterloo, Waterloo, ON, Can.
SOURCE: (1988) No pp. Given Avail.: NLC
From: Diss. Abstr. Int. B 1989, 49(10), 4117
DOCUMENT TYPE: Dissertation
LANGUAGE: English
AB Unavailable

L22 ANSWER 25 OF 27 CAPLUS COPYRIGHT 2009 ACS on STN DUPLICATE 8
ACCESSION NUMBER: 1989:20883 CAPLUS Full-text
DOCUMENT NUMBER: 110:20883
ORIGINAL REFERENCE NO.: 110:3509a,3512a
TITLE: Major sclerotial polypeptides of psychrophilic
fungi: temperature regulation of in vivo synthesis in
vegetative hyphae
AUTHOR(S): Newsted, W. Jay; Huner, N. P. A.
CORPORATE SOURCE: Dep. Plant Sci., Univ. Western Ontario, London, ON,
N6A 5B7, Can.
SOURCE: Canadian Journal of Botany (1988), 66(9), 1755-61
CODEN: CJBOAW; ISSN: 0008-4026
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Western blot anal. of the major sclerotial polypeptides of the psychrophilic
species *Myriosclerotinia borealis* (W51) and *Coprinus psychromorbidus* (LRS131)
indicated that these polypeptides were not present in vegetative hyphae during
growth at permissive temperature (5°), but significant accumulations were observed
in hyphae upon prolonged exposure to nonpermissive temperature (25°). In contrast,
low levels of sclerotial polypeptides were detected in the vegetative hyphae of
Typhula incarnata (W29) and *Typhula idahoensis* (W21). For the first time the in
vivo synthesis of the major sclerotial polypeptides were shown to be induced when
vegetative hyphae of *M. borealis* and *C. psychromorbidus* were shifted from 5 to 10°
for 12 h. In contrast, vegetative hyphae of *T. idahoensis* and *T. incarnata*
appeared to synthesize low levels of sclerotial polypeptides constitutively at 5°.
Furthermore, a shift from 5 to 10° had little effect on the synthesis of major
sclerotial polypeptides in the *Typhula* species. Prior exposure of vegetative
hyphae from all species to 25° for 2 days caused a marked reduction in the capacity
to synthesize sclerotial polypeptides. However, vegetative hyphae of *T. incarnata*
synthesized a new polypeptide of 35 kDa that had not been detected previously.
Antiserum to low mol. mass maize heat-shock polypeptides cross reacted with the
major sclerotial polypeptides of *T. idahoensis* only. Thus, the more psychrophilic
species examined, *M. borealis* (W51) and *C. psychromorbidus* (LRS131), exhibit
temperature-induced synthesis and accumulation of sclerotial polypeptides in
vegetative hyphae. In contrast, sclerotial polypeptides of the less psychrophilic
Typhula species appear to be expressed constitutively in vegetative hyphae.
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L22 ANSWER 26 OF 27 CAPLUS COPYRIGHT 2009 ACS on STN DUPLICATE 9

ACCESSION NUMBER: 1986:475652 CAPLUS Full-text
DOCUMENT NUMBER: 105:75652
ORIGINAL REFERENCE NO.: 105:12229a,12232a
TITLE: Temperature-dependent pattern of heat
shock protein synthesis in
psychrophilic and psychrotrophic
microorganisms
AUTHOR(S): McCallum, Kirk L.; Heikkila, John J.; Inniss, William
E.
CORPORATE SOURCE: Dep. Biol., Univ. Waterloo, Waterloo, ON, N2L 3G1,
Can.
SOURCE: Canadian Journal of Microbiology (1986), 32(6), 516-21
CODEN: CJMIAZ; ISSN: 0008-4166
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The patterns of proteins synthesized by the arctic psychrophilic bacterium Res-10 and the psychrotroph *Bacillus psychrophilus* during various heat shocks up to 32° were examined. Both microorganisms displayed temperature-dependent patterns of heat shock protein synthesis. Elevation of the incubation temperature of the arctic psychrophile from 0 to 15, 20, 25, or 32° induced the synthesis of ≥19 heat shock proteins. Imposing similar heat shock upon cells of the psychrotroph resulted in the induction of ≥25 heat shock proteins. Examination of the effect of the transcriptional inhibitor rifampicin on the synthesis of heat shock proteins revealed that the primary control of heat shock protein synthesis lies at the transcriptional level in both microorganisms.

OS.CITING REF COUNT: 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD
(6 CITINGS)

L22 ANSWER 27 OF 27 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1969:1207 CAPLUS Full-text
DOCUMENT NUMBER: 70:1207
ORIGINAL REFERENCE NO.: 70:207a,210a
TITLE: Thermally induced leakage of cellular material and
viability in *Vibrio marinus*, a psychrophilic
marine bacterium
AUTHOR(S): Kenis, Paul R.; Morita, Richard Y.
CORPORATE SOURCE: Oregon State Univ., Corvallis, OR, USA
SOURCE: Canadian Journal of Microbiology (1968), 14(11),
1239-44
CODEN: CJMIAZ; ISSN: 0008-4166
DOCUMENT TYPE: Journal
LANGUAGE: English

AB *Vibrio marinus* MP-1, an obligate psychrophilic marine bacterium, was severely damaged when heat-shocked in growth medium. Cells heat-shocked at 20°, 23°, and 25° in growth medium released 260 mμ absorbing material (nucleic acids and nucleotides), orcinol-reacting material (RNA), ninhydrinreacting material (amino acids), malic dehydrogenase, and glucose-6-phosphate dehydrogenase increasingly at higher temps. Older cultures were more resistant to thermal death, lysis, and leakage. No significant leakage or lysis could be detected after the heat-shocking of stationary phase cells in growth medium for 120 min. when >99.9% were killed. Cells in the log phase of growth were the most sensitive to death, leakage, and lysis. After 95% were killed at 25°, and 94% at 20°, cells began to release intracellular materials. Leakage and lysis occurred concomitantly after death. Loss of membrane permeability control before death would, therefore, not be indicated. The increased sensitivity to heat in young cultures may be attributed to thermolabile synthetic mechanisms involved in rapidly growing cultures.

=> s psychrophilic and (chaperon or chperonins)

L23 0 FILE MEDLINE
L24 1 FILE CAPLUS
L25 2 FILE SCISEARCH
L26 1 FILE LIFESCI
L27 1 FILE BIOSIS
L28 0 FILE EMBASE

TOTAL FOR ALL FILES

L29 5 PSYCHROPHILIC AND (CHAPERON OR CHPERONINS)

=> dup rem l29

PROCESSING COMPLETED FOR L29

L30 2 DUP REM L29 (3 DUPLICATES REMOVED)

=> d ibib abs

L30 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2009 ACS on STN DUPLICATE 1

ACCESSION NUMBER: 2004:744321 CAPLUS Full-text

DOCUMENT NUMBER: 142:35242

TITLE: Photosynthesis and cold acclimation: Molecular evidence from a polar diatom

AUTHOR(S): Mock, Thomas; Valentin, Klaus

CORPORATE SOURCE: Alfred-Wegener-Institute for Polar and Marine Research, Bremerhaven, 27570, Germany

SOURCE: Journal of Phycology (2004), 40(4), 732-741
CODEN: JPYLAJ; ISSN: 0022-3646

PUBLISHER: Blackwell Publishing, Inc.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The psychrophilic diatom *Fragilariopsis cylindrus* (Grunow) Krieger in Helmcke & Krieger was used to investigate photosynthesis and growth under freezing temps. Gene expression during a temperature shift from + 5° C to -1.8° C was studied under 3 and 35 µmol photons·m⁻²·s⁻¹ by using a macroarray. These measurements were paralleled by determination of fluorescence induction at PSII and pigment anal. The shift to -1.8°C at 35 µmol photons·m⁻²·s⁻¹ caused a marginal decrease of photosynthetic quantum yield (Fv/Fm) from 0.61 to 0.52 with fast recovery after 1 day. The ratio of chl c to chl a increased from 3.1 to 5.5, and the ratio of diatoxanthin to diadinoxanthin increased from 0.7 to 5.0. Genes encoding proteins of PSII (psbA, psbC) and for carbon fixation (rbcL) were down-regulated, whereas genes encoding chaperons (hsp70) and genes for plastid protein synthesis and turnover (elongation factor Efts, ribosomal protein rpS4, ftsH protease) were up-regulated. In contrast, cold exposure at 3 µmol photons m⁻²·s⁻¹ induced a marginal increase in Fv/Fm from 0.61 to 0.63 and a strong increase in fucoxanthin concns. from 0.04 up to 0.12 pg·cell⁻¹. This was paralleled by up-regulation of fcp genes. The ratio of chl c to chl a also increased from 3.1 to 4.2, as did the ratio of diatoxanthin to diadinoxanthin from 0.7 to 2.2. Down-regulation of psbA, psbC, and rbcL could also be measured but not up-regulation of hsp70, Efts, rpS4, and the ftsH protease. The latter genes are probably necessary to avoid cold shock photoinhibition only at higher light intensities. OS.CITING REF COUNT: 10
THERE ARE 10 CAPLUS RECORDS THAT CITE THIS

RECORD (10 CITINGS)

REFERENCE COUNT: 44 THERE ARE 44 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d ibib 2 abs

L30 ANSWER 2 OF 2 SCISEARCH COPYRIGHT (c) 2009 The Thomson Corporation on
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ACCESSION NUMBER: 2001:74248 SCISEARCH Full-text

THE GENUINE ARTICLE: 391ZR

TITLE: A cold acclimation protein with refolding activity on
frozen denatured enzymes

AUTHOR: Kawahara H (Reprint)

CORPORATE SOURCE: Kansai Univ, Fac Engn, Dept Biotechnol, 3-3-35 Yamate Cho,
Suita, Osaka 5648680, Japan (Reprint)

AUTHOR: Koda N; Oshio M; Obata H

CORPORATE SOURCE: Kansai Univ, Fac Engn, Dept Biotechnol, Suita, Osaka
5648680, Japan; Kansai Univ, High Technol Res Ctr, Suita,
Osaka 5648680, Japan

COUNTRY OF AUTHOR: Japan

SOURCE: BIOSCIENCE BIOTECHNOLOGY AND BIOCHEMISTRY, (DEC 2000) Vol.
64, No. 12, pp. 2668-2674.
ISSN: 0916-8451.

PUBLISHER: JAPAN SOC BIOSCI BIOTECHN AGROCHEM, JAPAN ACAD SOC CTR
BLDG, 2-4-6 YAYOI BUNKYO-KU, TOKYO, 113, JAPAN.

DOCUMENT TYPE: Article; Journal

LANGUAGE: English

REFERENCE COUNT: 37

ENTRY DATE: Entered STN: 2 Feb 2001

Last Updated on STN: 2 Feb 2001

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB We found that a cold acclimation protein from an ice-nucleating
bacterium, *Pantoea ananatis* KUIN-3, has refolding activity on frozen
denatured protein. Based on a SDS-PAGE analysis, we confirmed that the
cold shock-treated cells of strain KUIN-3 could produce some cold
acclimation proteins that inhibit their syntheses by the addition of
chloramphenicol during the cold acclimation. Among such proteins, Hsc25
had refolding activity similar to GroELs. Hsc25 was purified to
apparent homogeneity by (NH₄)₂SO₄ precipitation and some
chromatographies. The purified Hsc25 was composed of 8 subunits of
25,000 each with a molecular mass of 200,000 and had refolding activity
against denatured enzymes, which were denatured by heat-treatment at 100
degreesC, cryopreservation at -20 degreesC, or guanidine hydrochloride,
in a manner similar to GroELs. The N-terminal sequence of Hsc25 was
Met-Arg-Ala-Ser-Thr-Tyr-His-Ala-Ala-Arg-. Furthermore, Hsc25 had a high
level of activity at low temperature (12 degreesC). Also, the
dissociation constants, K_D (M) as the binding specificity for enolase,
mutarotase, isocitrate dehydrogenase, and lactate dehydrogenase were
1.82 x 10⁻¹⁰, 4.35 x 10⁻⁹, 8.98 x 10⁻¹², and 3.05 x 10⁻¹¹,
respectively. The affinity of Hsc25 for frozen denatured enzymes was
higher than the affinity for heat denatured enzymes when compared with
the affinity of GroEL. These results are the first report on the
characterization of a purified chaperon that was induced by cold
acclimation.

=> log y